REMARKS

Reconsideration and withdrawal of the rejections of this application, and consideration and entry of this paper are respectfully requested in view of the remarks herein.

The invention of the present application relates to, *inter alia*, odor-reducing garments for concealment. The garments are made of odor-absorbing and antimicrobial fabrics that comprise semi-dull polyester fibers and acetate fibers having blended therein an antimicrobial agent, wherein the acetate fiber is at least about 25% by weight of the fabric, and the polyester and acetate fibers are entwined.

The art June 3, 2003 Final Office Action contained art rejections based on Marier et al. (US 5,994,245; "Marier"), Denesuk et al. (US 6,196,156; "Denesuk '156"), and Denesuk et al. (US 6,240,879; "Denesuk '879"). The Office Action states that each of the documents described fibers that are needled together. *See* Office Action at 3, 5 and 7-8. Furthermore, the Office Action states that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself." Office Action at 4, 6 and 8.

It is respectfully submitted that while the process of manufacture of the present invention and of the three cited documents **are** different, the **products** produced by such processes are also different.

The carding and needling disclosed by the cited documents produce nonwoven fabrics in the form of mats, webs or batts. The production of nonwoven items depends on the inherent qualities of the fibers to curl and cling together when subjected to heat, moisture or pressure, including pressing and needling. Easily recognizable nonwovens include felt and batting (stuffing for pillows and quilts). Such items may be cut without developing ends that unravel, and may have varying densities. The Examiner is respectfully invited to review Appendices A, B, and C which contain various reference materials relating to the production of non-wovens, including glass fiber mats and felt. The materials were obtained from companies engaged in the business of manufacture of nonwovens themselves, or of machinery used in the manufacture of nonwovens.

Fabrics of the present invention are **not** considered nonwoven. Instead, the fabric of the present invention is made by "**weaving or knitting** fibers comprised of a polyester fiber and an acetate fiber." Specification at 12 (emphasis added). In the process of weaving or knitting,

fibers are interlocked by mechanical manipulation, by alternately crossing over other fibers in perpendicular fashion (as in weaving, wherein the weft is alternately drawn over or under the threads of the warp), or by the formation of a series of half- or slip- knots (as in knitting). Such methods as weaving and knitting produce fabrics commonly seen in clothing, such as knitted sweaters and woven shirts. Fabrics that are woven or knit have ends that unravel when the fabric is cut. The Examiner is respectfully invited to review Appendices D and E, which provide diagram of knit and woven fabrics, respectively.

As the cited documents pertain only to nonwoven items, and the present invention pertains to woven or knit fabric, it is respectfully submitted that the art rejections are improper and must be withdrawn.

CONCLUSION

In view of the remarks made herewith, the application is in condition for allowance. Consideration and entry of this paper, favorable reconsideration of the application, reconsideration and withdrawal of the rejections of the application, and prompt issuance of a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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DRAFT

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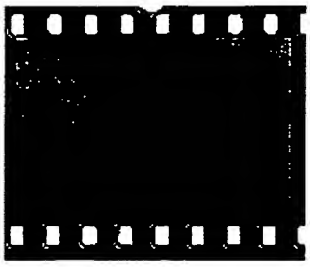
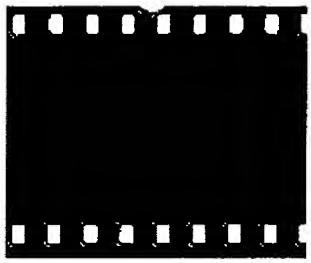


Nonwoven samples



Web, edge detail

Before needle punch

1. Introduction

During the last years there was a growing demand in nonwovens products, from natural or man made fibres, that are competitive to other products in order to increase sales and open up new marketing areas.

The most popular manufacturing methods for nonwoven products so far have been:

1. Method:

- Fibre opening
- Fibre handling and blending
- ***Carding***
- ***Cross lapping***
- Thermobonding or needle punching

2. Method:

- Fibre opening
- Fibre handling and blending
- ***Carding***
- ***Airlay***
- Thermobonding or needle punching

Both systems have their unique characteristics, have a high technical expenditure which result in high expenses for purchase, maintenance and energy. but are large scale and have to be assessed in fibre handling in a different way.

2. Consideration

The fibre handling of these systems have to be assessed in a different way.

Thin webs like produced with carding are not possible to achieve with aerodynamic web forming machines. The Phenomena of parallel fibres to the upwards direction in the nonwoven product can be observed if a certain thickness of web, produced by aerodynamic web formers, is crossed.

This Phenomena can only be eliminated by an additional cost effective technical process.

For the development and the realisation of such a production line, the following considerations have played a cruical role:

- ***Integration of fibre blending, pre- opening, fine opening and web forming on minimum of floor space***
- ***Opening of the fibre material up to single fibres without carding***
- ***Application is usable for synthetic and natural fibres, or a blend of them***
- ***Cost- effective web forming without the need of carding and arirlay***

3. Necessary machinery:

Among fibre preparation, blending and opening an additional fine opening device and a web forming machine, - that is adjustable in depth and height-, was necessary. These machines had to be developed to achieve a continuous course of the plant from fibre preparation to thermobonding or needling process under consideration of development of dust by processing natural fibres.

4.1 Layout 1

- Weighing hopper, volumetric
- Weighbelt
- Cross collection belt
- Pre- blender
- Disc Opener
- Cleaning device (only for natural fibre material)
- Fine opener
- Mixmaster
- Web forming unit
- Thermobonding / needle punch

4.2 Layout 2

- Weighing hopper, volumetric
- Weighbelt
- Pre- flaker
- Cross collection belt
- Disc Opener
- Cleaning device (only for natural fibre material)
- Fine opener
- Mixmaster
- Web forming unit
- Thermobonding / needle punch

5. Working principle Layout 1

Fibre is placed dependent on the used components at the Bale opener - Hopper feeder which are equipped at their delivery side with a vibrating unit.

Fibre is given to a weigh belt, setting in kg/h and fed to a collecting belt. The collecting belt is transporting the fibre components to the pre blend - hopper, pre- blended and pneumatically conveyed to the Disc Opener for further opening.

After the Disc Opener the fibre is transported to the Continuous Cleaner (only necessary by natural fibres) cleaned and transported to the Multi Fine Opener.

At the fibre exit of the Multi Fine opener the fibre is conveyed pneumatically to the blendmaster, which is fed in horizontal layers. The blendmaster is emptied in vertical layers by, means a spiked lattice an given to an additional opening roller until the fibre material reaches the Dosing System.

The insulation material is formed by an vibrating unit inside the dosing system. The formed product can now be thermobonded or needled.

Working principle 2

Same principle as 1 but with a better blending of smaller and bigger parts of the components. The fibre is fed after the weigh belt and the needle opener fluffy to the collecting tube, sucked Through the Disc Opener and given to the following machinery.

6. Advantages

- ***High production rate - Low production costs***
- ***Low purchase costs***
- ***Little floor space required***
- ***Machinery in compact design***
- ***Little maintenance and attrition.***
- ***Good Cohesion of fibres in X and Y direction***
- ***Adjustable density and weight***

7. Summary

Because of our considerations and experience in the field of fibre opening, it was possible to design a plant, which makes the production of nonwovens products in a competitive way.

The described production process for nonwovens ist just an example for our efficiency and can be modified depending on your product requirements.

Learn About

How Felt is Made

Unlike textiles which are woven or knitted, felt is formed using the inherent qualities of the wool fibers to curl and cling together when subjected to heat, moisture and pressing. Some felts are 100% wool; many are blends of wool and synthetic fibers. Some are made by pressing, others by needling. Both processes work to entangle and interlock the fibers.

The first step in pressed felts is mixing, which loosens the stock, opens up any lumps or tangles and blends the fiber types. Then it is sent to the carding operation. The purpose of carding is to orient the fibers in a roughly parallel status with each other, to form the felt uniformly. The carding machines have rotating cylinders covered with fine teeth to "comb" the fibers into thin layers, which are then built up on top of each other into a "batt". Batts can vary in thickness from ½ inch to several inches thick depending on the desired characteristics. Batts are created using both lengthwise and crosswise webs, so that the felt has about the same strength in all directions. The batt is trimmed and rolled up to be transferred to the hardening stage.

Hardening is a process which converts the soft batts into forms with greater strength. The batt is wetted and pressed between steel platens which vibrate to help the fibers interlock and cling together. This is just the initial stage of felting. Then the felt moves to the fulling stage.

Fulling is a method for further strengthening the felt by helping the fibers interlock even more. The rolls are opened out, moistened, folded into the fulling machine, which uses hammering action to compress and then release the felt

After fulling, the felt is washed, dyed if desired, and dried, then finished in several ways such as shearing, sanding, brushing, pressing or trimming.

Needling is used to produce felt from fibers that do not have the natural felting (curling and interlocking) ability of wool. Synthetic felts can be made using this process. Barbed needles penetrate and compress a batt of fibers to interlock them into a uniform and strong felt. These can be made from various fibers such as rayon, nylon, polyester, acrylic and polypropylene.

Advantages of Felt

Felt is a truly unique and versatile fabric, with characteristics unlike any other type of fabric. Here are just a few of the advantages you will see from using felt

for your application.

Cuts to a **clean edge**
Does not ravel
Does not fray
Can be cut into **any shape or size** with **no need to finish edges**
Excellent polishing agent-**doesn't wear**
Sewable
Resists deterioration and wear
Can be exposed to weather
Maintains its physical properties even as it wears (great for board erasers)
Highly oil absorbent-**great for wicking**
Retains several times its weight in fluids-used for writing instrument tips
Extraordinarily resilient-can be compressed and released thousands of times without deforming
Excellent **heat insulating** ability-used in clothing and liners, shoe insoles
Excellent **sound insulator**-used in cars, airplanes, anywhere sound deadening needed
Vibration dampening
Superb filtration ability-used in many liquid and gas filtration applications
Great **padding material**-used for medical treatments such as splints
Incredible **diversity** of the fabric:
- **From 1/32 inch to 3 inches thick**
- **Soft as wool to hard as wood**
- **Full range of colors**
- **Can be made water repellent or absorbent**

Wool felt is **virtually ageless**-retains strength and resilience for **decades.**
Wool felt is **chemically resistant**.
Wool felt is **flame resistant** and **self-extinguishing.**

Characteristics of Impregnated Felt

As diverse as raw felt is, it can be even **further enhanced** by **impregnating** it with an unlimited variety of substances to get the characteristics you need. Spartan Felt is the world leader in felt impregnation.

Polishing agents can be **impregnated directly into felt**, an enormous time-saver compared to using separate polishing compounds and felt materials. Spartan Felt offers a range of polishing felts from **fine to aggressive**, even a **diamond impregnated** product for grinding and removing stock, whether it is glass, metal or plastic you are working with. Please see our product section for a full listing of the polishing felts available.

We can impregnate **virtually any particulate matter** into our felt products.

Call us and let's imagine new products together!

How Spartan Felt Can Be Your Best Partner

Spartan Felt Company has a **40+ year history** and has the size and resources you need to feel confident you are dealing with complete professionals in the industry. And yet we have remained committed to delivering **individually customized service** to our customers. We are not a billion-dollar corporation complete with red tape and a "do it our way" attitude. Instead, we want to hear your individual problems and challenges and try to **help you find solutions. Our team of engineers, R&D staff, nonwovens experts,** and **fiber technology experts** has stepped in countless times to **engineer creative solutions** that have **delighted our customers.** Whether it is **improved products, cost reductions, process improvements** or **new product development,** Spartan Felt is ready and willing to **partner with you** to **advance your business.**

Give us a try...we think you will be amazed by our capabilities and most of all, by how much we care.

Spartan Felt Company - US 221 & I-26 - Spartanburg, South Carolina USA 29304
Telephone - (864) 576-7919 Fax - (864) 574-4507

Basic Knit Instructions

Home
Why Knit or Crochet?
Knit vs. Crochet
The Basics
Getting Started
Project Ideas
Discussion Forums

HOME | WHY KNIT OR CROCHET | KNIT VS. CROCHET | THE BASICS
GETTING STARTED | PROJECT IDEAS | DISCUSSION FORUMS

Reading Patterns & Abbreviations
Basic Crochet Instructions

The instructions below will show you how to cast on and to make a knit stitch, also known as garter stitch. If you follow them exactly, you'll complete a 7" by 9" block, which will be great practice and help a good cause: Warm Up America! Learn how your block can be joined with others to create an afghan to warm up someone in need.

With these basics, you can make a scarf, hat, pillow, bag or any number of projects.

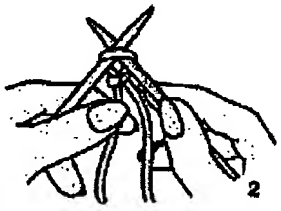
Beginner Knit Block

What you need:

- Worsted-weight yarn, any color or colors
- Size 8, 14"-long knitting needles
- Yarn needle with big eye
- Small scissors

Casting On

Step 1: Make a slip knot on the shaft of one needle. This counts as your first stitch.



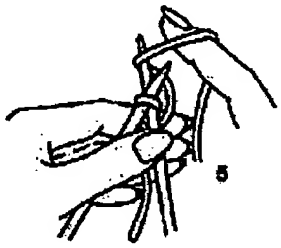
Step 2: Place this needle in left hand. Hold other needle in right hand to control the yarn. Insert point of right needle, from front to back, into the slip knot and under the left needle.

Step 3: Hold left needle still in left hand, and move left fingers over to brace right needle.

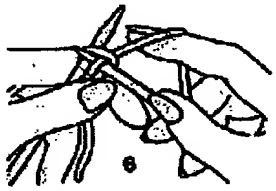
Step 4: With right index finger,

pick up the yarn from the ball.

Step 5: Release right hand's grip on the needle, and use index finger to bring yarn under and over the point of right needle.



Step 6: Return right fingers to right needle, and draw yarn through stitch with point of right needle.

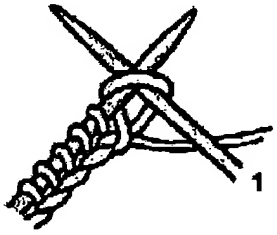


Step 7: Slide point of left needle into back of new stitch, then remove right needle.

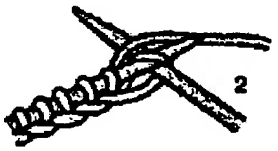
Step 8: Pull ball yarn gently to make the stitch fit snuggly on needle. You have now made one stitch (called casting on), and there are two stitches on left needle (slip knot is counted as a stitch).

Step 9: Insert point of right needle, from front to back, into stitch just made, and under left needle. Repeat Steps 5 through 9, 26 more times, until you have 28 stitches on the left needle. This completes the cast-on row, which is the way all knitting is begun.

First Knit Row



Step 1: Hold needle with stitches in left hand; insert point of right needle in first stitch, from front to back, just as in casting on.

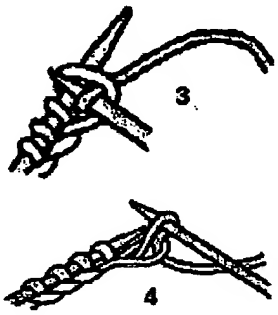


Step 2: With right index finger, bring yarn from ball under and over point of right needle.

Step 3: Draw yarn through stitch with right needle point.

Step 4: This step now differs

from casting on: Slip loop on left needle off, so new stitch is entirely on right needle.



This completes one knit stitch. Repeat Steps 1 through 4 in each stitch still on left needle. When the last stitch is worked, one row of knitting is completed.

Now measure your work. It should be about 7" wide. If it is too wide, start over and cast on fewer stitches; if it is too narrow, start over and cast on more stitches.

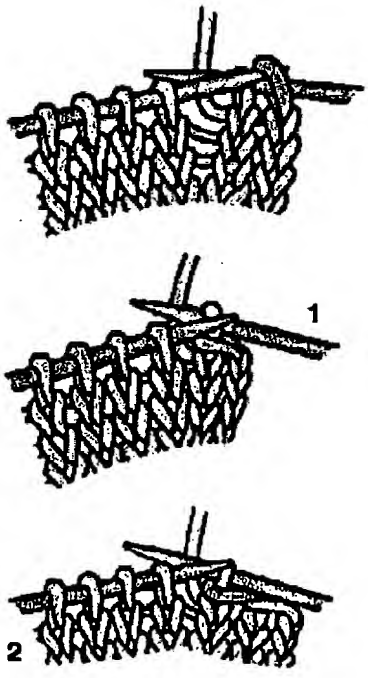
When the width is correct, begin next knit row as follows: turn right needle and hold it now in left hand. With free needle in right hand, work Steps 1 through 4 of First Knit Row in each stitch. Again take needle with stitches in left hand, and work another row of knit stitches. Work rows of knit stitches until block measures 9" long.

To complete the block, now bind off all the stitches.

Binding Off

Step 1: Knit the first 2 stitches; insert left needle into stitch you knitted first, and pull it over the second stitch and completely off the needle.

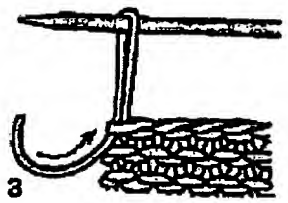
One stitch is now bound off.



Step 2: Knit one more stitch, insert left needle into first stitch on right needle, and pull it over the new stitch and completely off the needle. Another stitch is bound off; don't work too tightly.

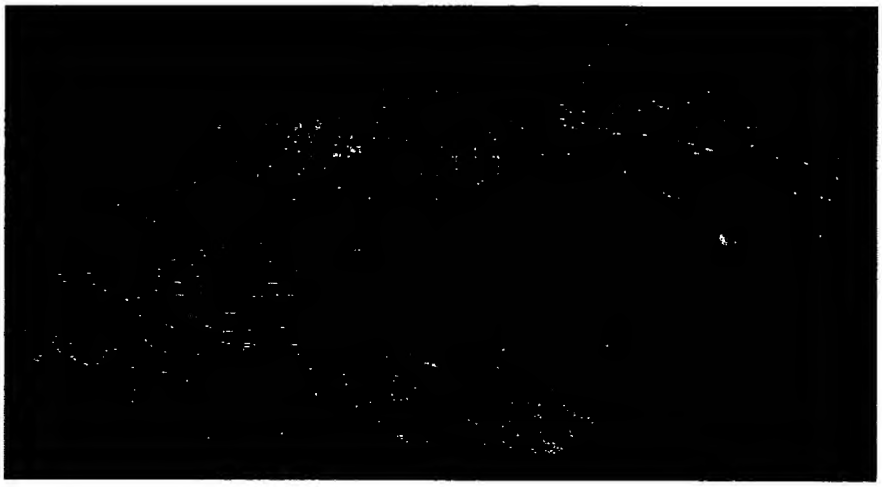
Repeat Step 2 until one stitch remains; now cut yarn from skein, leaving a 6" end. With needle draw end up and through last stitch to secure it. Thread yarn end into yarn needle and weave end into several stitches to

secure it.



For more knitting instruction, information, and fun things to do with your knitting, go to the Getting Started page for a list of helpful books, videos, CD-Roms, and web sites.

Need help? Post your question on our bulletin board. You may find the answer to your question already posted.



WBRM Textile and non woven fabrics

To evaluate the possibility of use of the **WBRM** fibers produced in the project, many tests related to use in different sectors have been carried on. First of all we are going to describe the results obtained in the "non woven " sector , as for the production and characterization of the textiles we needed greater resources and time than those foreseen in the project.

Non woven fabrics production

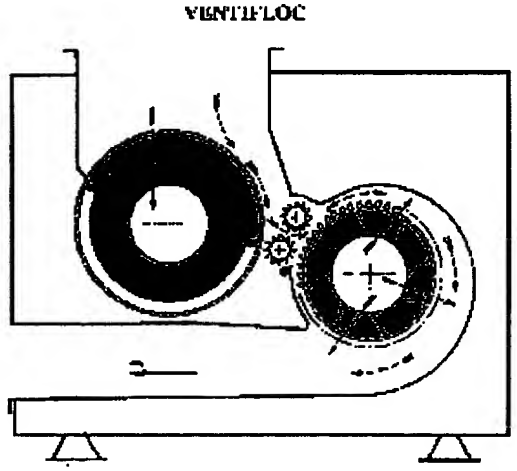
The sector of non woven fabrics is actually an important user of glass fibers that are used to reinforce the composites materials, for the thermal insulation, for industrial mufflers, filtering. In order to produce non woven fabrics, fibres C3 sized with amino-propylsilane have been cut to 60 mm in length which is equal to the value of industrial fibers. The potentialities of this fibers have been evaluated in all the most important processes typical of the industry of non woven fabrics, and also on tests on finished composites. Moreover, a conventional fibre already present on the market (E fiber) has also been employed to compare behaviour during processing step as well as properties of end-product.

The different steps for manufacturing non woven fabrics are :

- opening of fibres
- carding and crosslapping
- needling of web.

Opening of fibers

During this step, fibres are prepared to avoid agglomerates and packets. To obtain fibres perfectly opened before carding and crosslapping, we open material with our laboratory opener : the VENTIFLOCK which is describe in the following figure. Material to open arrives in the machine in the arrow direction. The fibres pass between two small teeth rolls, which deliver material with a low speed. Fibres are pulled out in tuft form by teeth roll, which have a high speed. At the output of this machine, the fibres are opened.

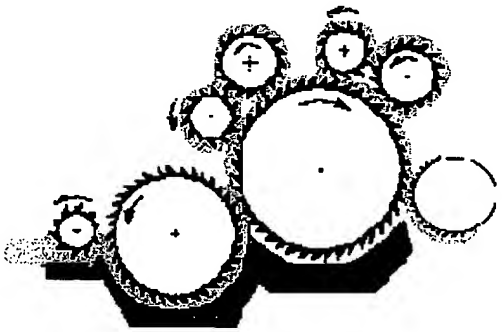


Ventifloc

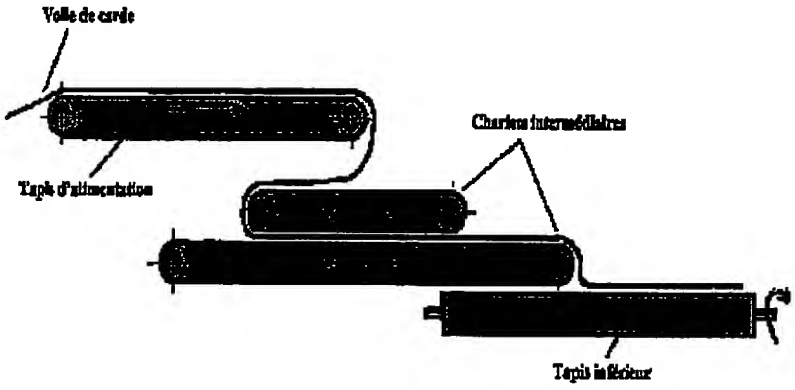
Carding and crosslapping

The carding process finishes opening step and puts the fibres parallel. However, the main aim of this machine is to manufacture a carding web without mechanical resistance. After this process, the carding web is introduced in the crosslapping equipment in order to

make high weight web (the carding web are superimposed on itself). Following figures show carding and crosslapping devices. Carding equipment is composed with different rotating cylinders which induce oriented fibres. There are also teeth rolls, which work the material to obtain the carding web. On the scheme, course of fibres is indicated in yellow colour. On the crosslapper diagram, the course of the carding web is indicated in pink colour. The carding web passes through the different conveyors and the final conveyor has a swinging movement above the reception conveyor, which has itself a perpendicular movement with regard to the movement of the final conveyor.



Card



Crosslapper

Needling of web

During this step, web is needled in order to link different layers as well as to interlock

fibres and therefore increase cohesion of product. This process induce an orientation of fibres in the thickness way. Needling conditions applied to perform our tests are :

- needles : 15-18-32-3.5RB30
- plank with 4000 needles
- speed : 2.3 m/min
- needling density : 34 stroke/cm^2.

Our equipment permits to produce continuous needled felt with 60 cm in width. Non-woven fabrics have been obtain without problem in the case of fibres provided by SSV as well as conventional fibres. Processing parameters previously describe have been employed for both kind of fibre.

Technical characterization of obtained non woven fabrics

In this phase, it has been evaluated technical characteristics of the finished products obtained with the new fibres and of the differences in comparison to the ones with traditional fibres. Following parameters of non-woven fabrics have been quantified :

- thickness
- grammage
- thermal resistance.

These measurements have been performed in the case of one sample obtained with the WBRM fibres and two different products elaborated with conventional E-glass manufactured by Vetrotex.

Thickness

Results are expressed in the following table :

Sample	Thickness(mm)
1 - Conventional E glass fibers	5,9
2 - Conventional E glass fibers	10,6
3 - WBRM C3	5,8

Grammage

Results are expressed in the following table :

Sample	Grammage (g/m^2)
1 - Conventional E-glass fibers	230
2 - Conventional E-glass fibers	460
3 - WBRM C3	230

Thermal resistance

We performed thermal insulation experiments according to testing standard NF EN 31092. Non-woven is put on a plate regulated in temperature (35 °C). A draught is applied on the other side of non-woven (parallel, 1 m/s, 20 °C). A measurement of electrical power to keep plate at constant temperature gives thermal resistance of tested sample.

Results are expressed in the following table :

Sample	e	R	R/e
1 - Conventional E-glass fibers	5,9	0,173	0,029
2 - Conventional E-glass fibers	10,6	0,286	0,027
3 - WBRM C3	5,8	0,151	0,026

Legend : e: thickness (mm) R: thermal resistance (m^2K/W)

Regarding thermal resistance values, these results show an increase of R according to thickness, which is normal. However, the more interesting result is expressed by R/e. If a correction of thickness effect is introduced, obtained values show that samples elaborated with new fibre gives similar behaviour in comparison to conventional product.